Daily Diary Report by Bid Item

Contract No.: **04-0120F4**
Diary #: **472** **Const Calendar Day:** 850 **Date:** **06-Jan-2012** **Friday**
Inspector Name: **Bruce, Matt** **Title:** **Transportation Engineer**
Inspection Type: Continuous
Shift Hours: 10:00 am 02:00 am **Break:** 01:00 **Over Time:** 07:00
Federal ID:
Location:
Reviewer: **Schmitt, Alex** **Approved Date:** **Status:** Submit

04-0120F4
04-SF-80-13.2/13.9
Self-Anchored
Suspension Bridge

Weather

Temperature **7 AM** 40 - 50 **12 PM** 50 - 60 **4PM** 50 - 60
Precipitation 0.00" **Condition** Partly cloudy to clear

Working Day ☐ If no, explain:

Diary: Dispute ☐

Work description.

- The tasks completed today by the Alta Vista surveyors included the following:

1.) Checked the elevation difference between control points MB007, ARMY2 and SKY3 prior to the evening survey of cable strand #1. This was done without my direction.

2.) Assisted me with checking the sag of cable strand #1 at the west loop between the E-Line deviation saddle face and south face of the jacking saddle. The average sag measured for the south loop was 82mm. The following conditions were observed during the survey at the west loop:

Started @ 7:40pm, End @ 8:10pm
Ta = 51F (Partly cloudy)
Ts = 52F
W = NW @ 6mph

All four corner wires were surveyed due to different sags just like last nights survey.

3.) Assisted me in the verification of the concurrent survey done with ABF surveyors of cable strand #1 on the North/South main and sidespans at the midpoint. Chris used the Trimble total station occupying control point MB007 on the Treasure Island Navy Pier. His responsibility was to confirm the horizontal coordinates staked-out by the Topcon GPS equipment. The elevation measured by the total station on MB007 was used only as reference to compare with the trig-level and GPS elevations. Chris was responsible for recording the ambient/steel temperatures, times of measurement, and K-value measured/reported by me. Dave was responsible for using the Nikon total station to trig-level the elevation from the W2 cap beam and east end of the SAS. I was responsible for taking the GPS measurements and recording the steel/ambient temperatures and K-values. Erol was responsible for assisting me and holding the rod for both total stations. Also Erol assisted me with keeping the GPS equipment steady on the cable strand as it would sway a little bit.

The following conditions were observed during the night survey at a given location and measured in the following order:

// North Side Span //
Started @ 11:00pm, End @11:10pm
Ta = 46F
Ts = 49F
W = NE @ 3mph

P = 30.40"Hg
Number of GPS measurements at 5 epochs = 15 (K=1)

// South Side Span //
Started @ 11:30pm, End @ 11:45pm
Ta = 47F
Ts = 49F
W = Calm
P = 30.40"Hg
Number of GPS measurements at 5 epochs = 12 (K=1)

// North Main Span //
Started @ 12:45am, End @1:00am
Ta = 48F
Ts = 49F
W = NE @ 3mph
P = 30.40"Hg
Number of GPS measurements at 5 epochs = 14 (K=1)

// South Main Span //
Started @ 1:15am, End @ 1:35am
Ta = 46F
Ts = 48F
W = NE @ 2mph
P = 30.40"Hg
Number of GPS measurements at 5 epochs = 11(K=1)

The following elevations were trig-leveled with the Nikon total station as used for the acceptance elevation after the midpoint was staked-out with the GPS equipment and the total station on Treasure Island:

24N: Elev = 99.222m, Design Elev. = 99.205m, Delta = 17mm (Cut)
24S: Elev = 97.817m, Design Elev. = 97.816m, Delta = 1mm (Cut)
80N: Elev = 78.667m, Design Elev. = 78.644m, Delta = 23mm (Cut)
80S: Elev = 78.832m, Design Elev. = 77.835m, Delta = 3mm (Fill)

The deltas for the horizontal coordinates from design were evaluated in the field and were acceptable. At the end of the night/early morning, cable strand number one was accepted by me in its final free hanging position.

Work began on the sidespans and ended with the mainspans. ABF had two total stations and two rodmen for the operation, one on the north side and one on the south. The ABF total stations/surveyors occupied control points TWL270 and resected from the Skyway bikepath from control points E2, E3, and AJ641. The coordinates for the control points used by ABF surveyors in their revised project control are not that much different than the original Caltrans project control map. Therefore the control was not an issue for this survey. The ABF surveyors also both shot a point set up on top of tower to tie in both the back and main span measurements. ABF survey party chief Dave Adams was present for the survey and numbers/issues were also discussed with him during the operation. ABF engineers Zach Lauria, Adam Roebuck, and Levi Gatsos were also present for the operation. Zach was responsible for adjusting cable strand number one. Adam reviewed the numbers measured by ABF surveyors. Levi was responsible for assisting the ABF rodmen. Levi also shared real time information with me and I shared real time information with him during the survey. After the initial survey of each span, further adjustment was necessary for both sidespans and South mainspan. The North mainspan did not require further adjustment. Interim surveys were performed by the Contractor after every adjustment. When the strand reached a satisfactory sag position in each span, all clamps and adjusting devices were removed to allow the strand to be in a free hanging position. In this position, the Contractor's and Caltrans' Surveyors performed a final survey.

It should be noted that the GPS receiver/prism/rod was placed on top of the cable strand and held plumb for the measurements.The cable strand would move slightly in the offset and vertical directions due to the adjusting force oscillations and wind. Therefore multiple measurements were taken to achieve the most probable location of the cable strand. All GPS measurements were taken at 5 epochs since the cable strand was moving. The actual sequence for the Caltrans survey was me using the GPS to check the mark placed by ABF surveyors on the cable strand. Then using the prism/rod, the total station occupying control point MB007 on Treasure Island would shoot the point. After the Treasure Island total station got a measurement the rod was then turned to the total station on the deck doing the trig-leveling. The ABF surveyors didn't place a noticeable mark on the south sidespan cable strand, therefore I staked the point out to obtain our verification measurements. To reiterate MB007 was used to check horizontal and vertical measurements of the GPS and trig-level. Also all four spans could be sighted from MB007. The trig level on the deck was based on temporary benchmarks established weeks before this survey. Multiple level runs with the automatic level were done for the temporary benchmarks with various steel temperatures to ensure the elevations were acceptable and not moving. The steel temperature was measured with an infrared temperature gun probe that was wedged in between the center of the cable strand wires where the survey measurement was taken.

Roman Granados, Alex Schmitt, and John Lyons were responsible for monitoring the operation to adjust the cable strand within the proper tolerances. They also assisted me and the Alta Vista surveyors with mobilizing the surveying equipment. See other inspector diaries in the Team Cable group for labor, equipment, and additional observations.

- The following is the hours worked by the Alta Vista consultants today:
  Dave Garrett (survey party chief) = 12hrs
  Chris Ferrucci (instrumentman) = 12hrs
  Erol Schaller (rodman) = 12hrs

The consultants began their shift at 2:00pm and worked until 2:30am Saturday morning. After this survey the consultant surveyors are no longer needed by Team Cable for any more surveys on the bridge cable.

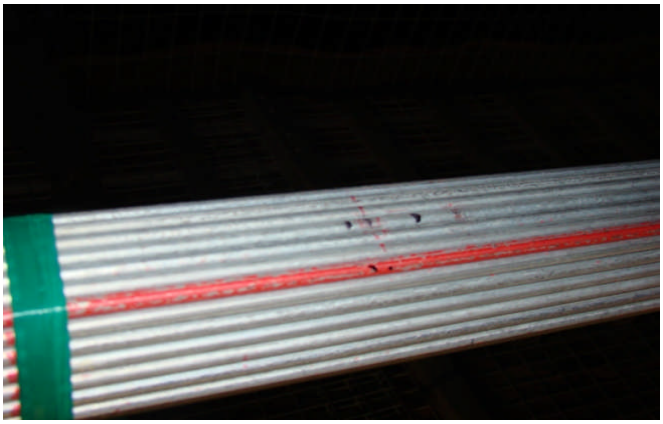
- Prepared for tonight's survey, and after the survey was completed I began to review the results with the Alta Vista surveyors for the first cable strand survey. All of the numbers from the GPS, Trig-level, and TI total station would be processed tomorrow and distributed to ABF on Monday January 9th for comparison.
- Received the Topcon GRS-1 GPS equipment from ESC representative Chuck Madrid. To reiterate the GPS equipment had a software upgrade for TOPSURV and the RTK engine (enables a quicker "fix" to the ESC network) inside the data collector was replaced. It should be noted that this was done at no cost to the State.
- Checked the calibration of the GPS equipment in the afternoon to ensure that the measurements would be accurate for tonight's survey of cable strand number one.

Attachment

Daily Diary Report by Bid Item

Job Name: 04-0120F4 **Inspector Name** Bruce, Matt **Diary #:** 472 **Date:** 06-Jan-2012 Friday

Position of cable strand number 1 during the day while the operation of "rough" adjsutment was being done on the sidespan at midpoint.



Marks placed by ABF surveyors and engineer at the north sidspan surveyed midpoint.

ABF rodman holding the prism/rod for a shot on cable strand number 1 at the north sidespan.

Position of cable strand number 1 during the day while the operation of "rough" adjsutment was being done on the mainspan at midpoint.